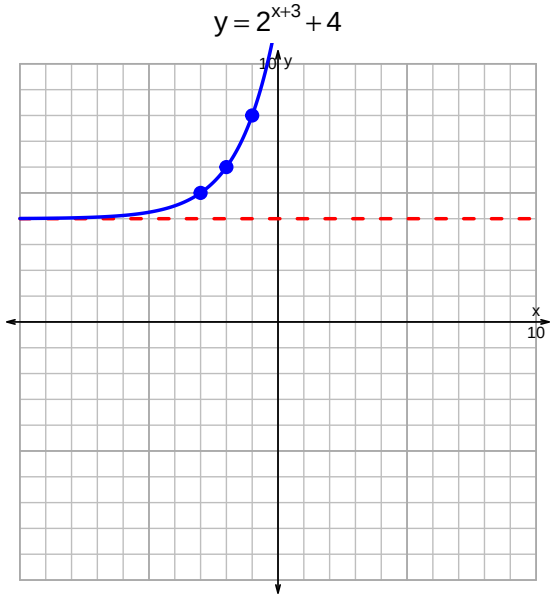
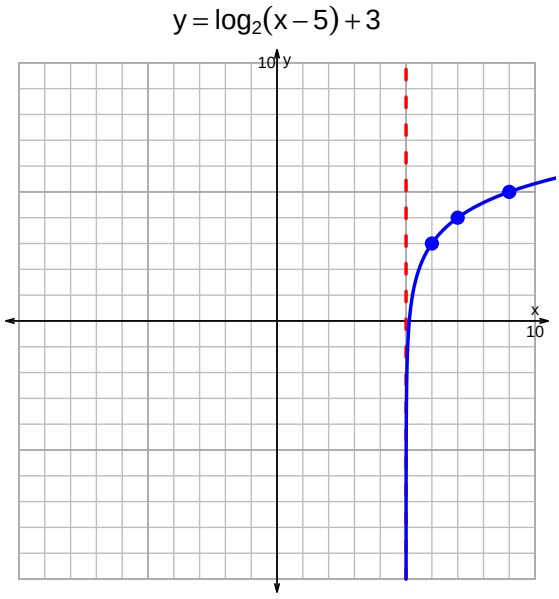
Name: Date:

s18quiz: EXP LOG (Solution v113)

1. Graph $y = 2^{x+3} + 4$ and $y = \log_2(x-5) + 3$ on the grids below. Also, draw any asymptotes with dotted lines.





2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$19 = \left(\frac{3}{5}\right) \cdot 2^{7t/4}$$

Divide both sides by $\frac{3}{5}$.

$$\frac{19 \cdot 5}{3} = 2^{7t/4}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{19 \cdot 5}{3}\right) = \frac{7t}{4}$$

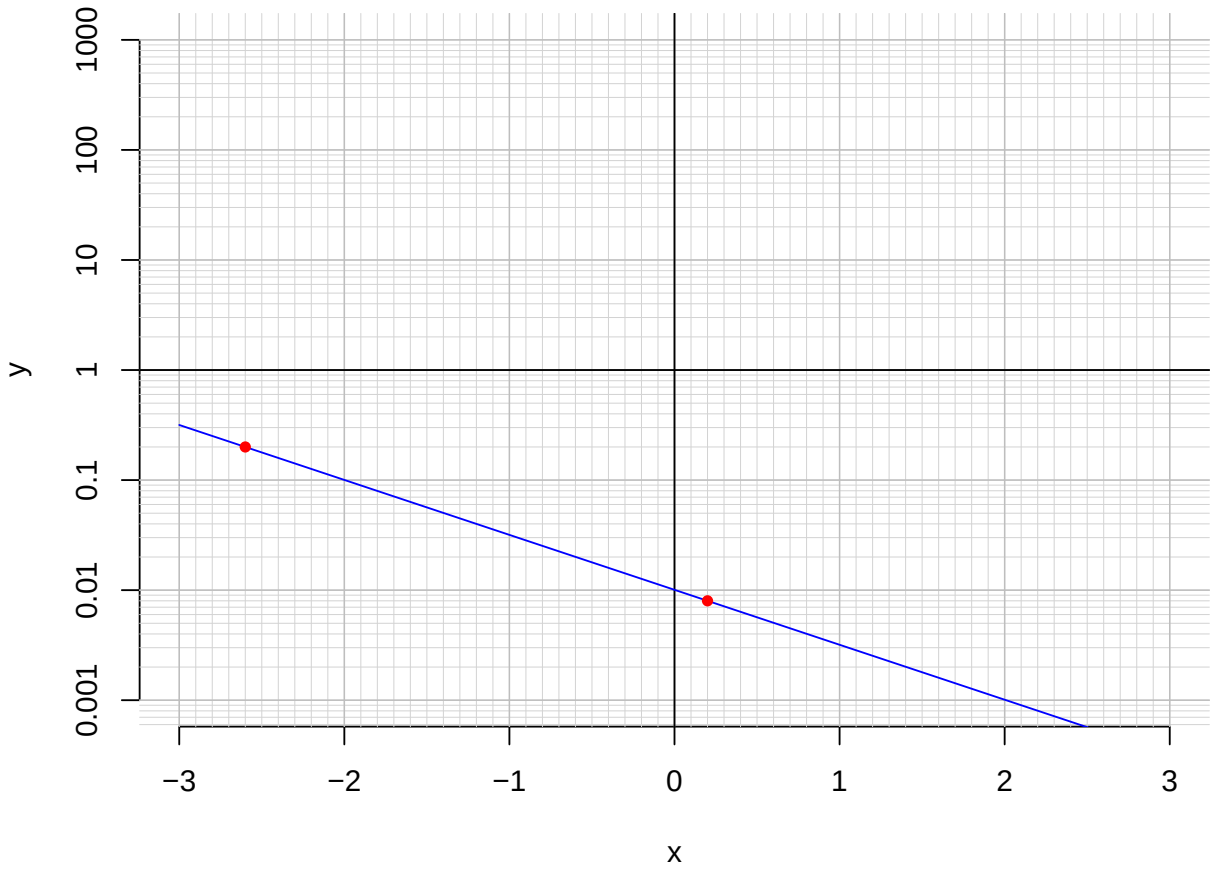
Divide both sides by $\frac{7}{4}$.

$$\frac{4}{7} \cdot \log_2\left(\frac{19 \cdot 5}{3}\right) = t$$

Switch sides.

$$t = \frac{4}{7} \cdot \log_2\left(\frac{19 \cdot 5}{3}\right)$$

3. An exponential function $f(x) = 0.0101 \cdot e^{-1.15x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-2.6)$.

$$f(-2.6) = 0.2$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{1.15} \cdot \ln\left(\frac{x}{0.0101}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.008)$.

$$f^{-1}(0.008) = 0.2$$